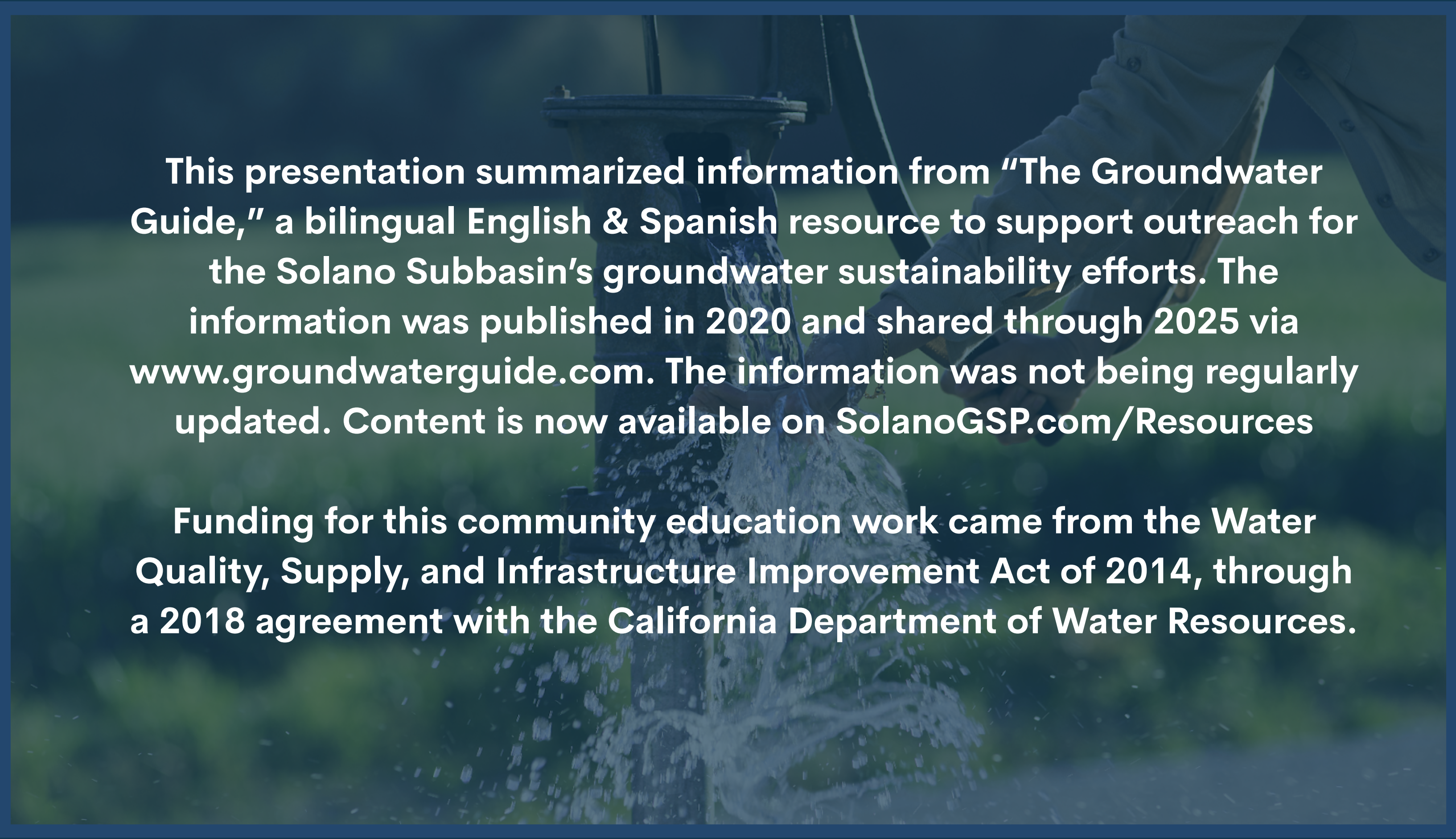


GROUNDWATER GUIDE

May 21, 2026

A person wearing a light blue long-sleeved shirt is operating a water pump. The pump is a dark, vertical metal structure with a handle. Water is spraying out of the top of the pump in a powerful, upward jet, creating a misty spray. The background is a blurred green field. The entire image is overlaid with a semi-transparent dark blue filter.

This presentation summarized information from “The Groundwater Guide,” a bilingual English & Spanish resource to support outreach for the Solano Subbasin’s groundwater sustainability efforts. The information was published in 2020 and shared through 2025 via www.groundwaterguide.com. The information was not being regularly updated. Content is now available on SolanoGSP.com/Resources

Funding for this community education work came from the Water Quality, Supply, and Infrastructure Improvement Act of 2014, through a 2018 agreement with the California Department of Water Resources.

Groundwater 101

When water is going through its cycle...



...the water lands in various places



Cities



**Natural
Bodies of
Water**

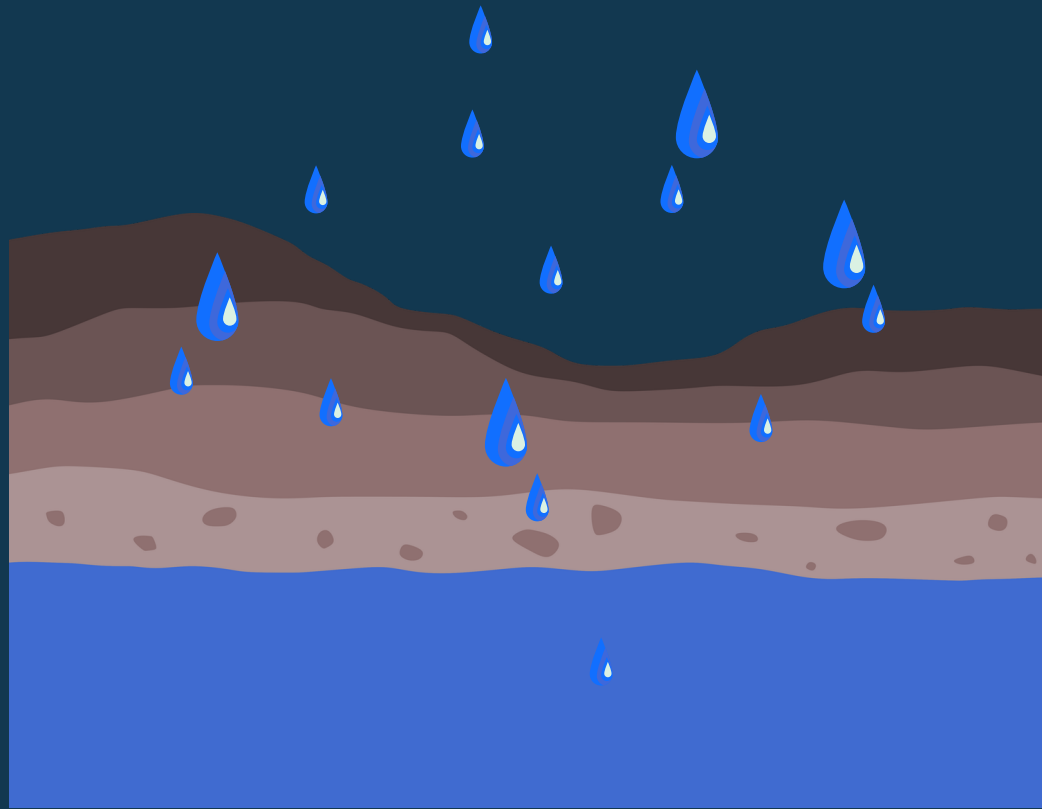


Farmland



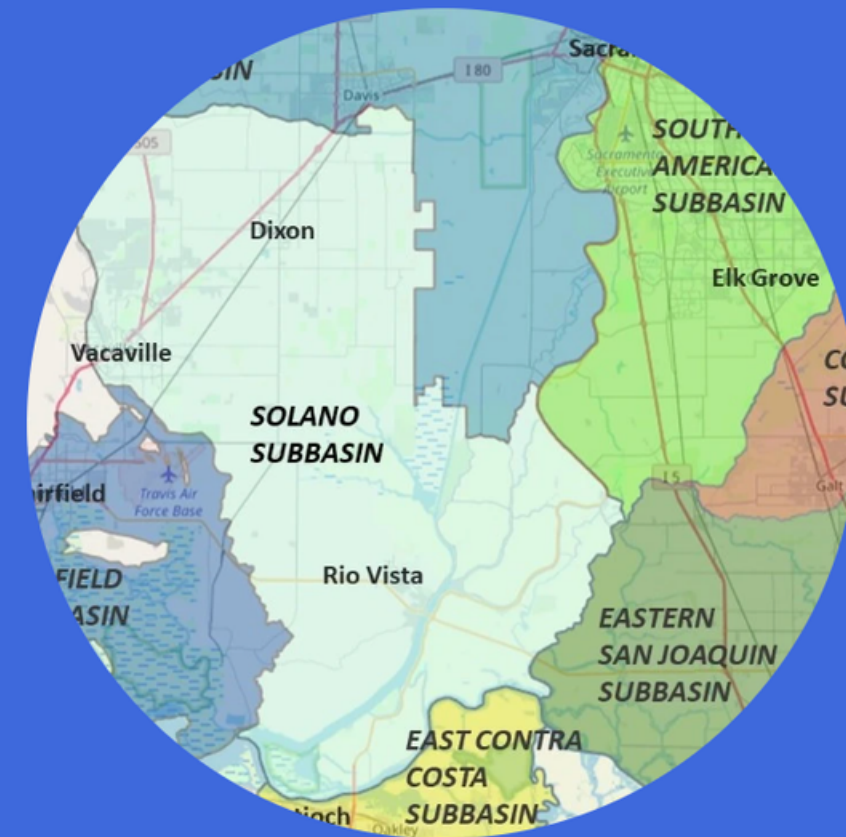
Nature

What is Groundwater?

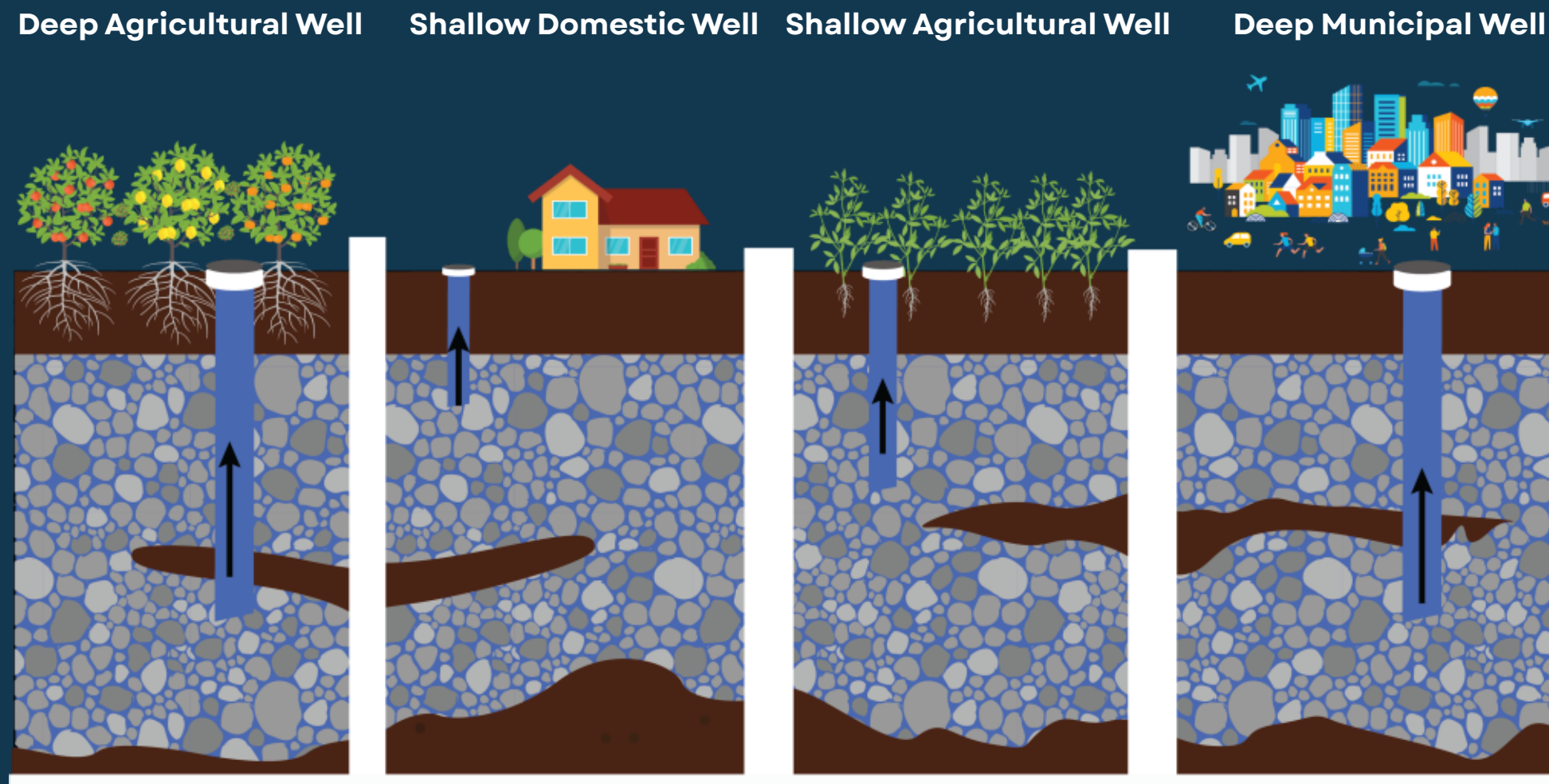


Some water also seeps into the soil hundreds of feet below the surface. It's stored in natural underground water tanks called aquifers. Groundwater aquifers exist beneath the surface in layers of rock and sand.

Aquifers that interact with one another in a system form a **Groundwater Basin**. For the purposes of water management, the California Department of Water Resources (DWR) divides groundwater basins into subbasins to help capture local conditions and variations.



How do we Access Groundwater?



01

Types of Wells

Groundwater is pumped to the surface through wells. These wells vary in size and depth. Several factors determine the type of well used to pump groundwater:

- How the groundwater will be used (sometimes called "beneficial use", e.g., drinking water, crop irrigation, public water supply).
- The underlying geology of the well location, including the depth to groundwater from the surface.

[LEARN MORE ABOUT WELL CONSTRUCTION](#)

[LEARN MORE ABOUT DOMESTIC WELLS](#)

Once pumped from the underground aquifer, this water is used for many purposes...



...and by many "beneficial users."



How do we use groundwater?

Communities, economies, and ecosystems all depend on groundwater for different uses.



01 “Beneficial User and Uses”

Water law in California requires that water be used in ways that are both beneficial and reasonable. This is why water uses and users are referenced as “beneficial uses and users.”

Examples include:

- households using water for drinking
- farms using water for irrigation
- restaurants using water for washing dishes
- habitats such as wetlands and streams

This term refers to all [legal applications](#) of groundwater for “beneficial use”.



02 Water Quality

Over time, groundwater can become contaminated. Groundwater contaminants can occur naturally or result from human-caused pollution (e.g., pesticides, dumping). In some cases, even if groundwater is available to pump from our wells, it may not be safe to use without additional treatment.

[LEARN MORE ABOUT GROUNDWATER QUALITY](#)

How do we use groundwater?

Communities, economies, and ecosystems all depend on groundwater for different uses.



03

Groundwater Dependent Ecosystems

The plants, animals, and ecosystems that rely on groundwater are known as “Groundwater-Dependent Ecosystems” (GDEs). Some trees, such as local oaks, willows, and cottonwoods, have roots that reach and depend on groundwater. Wetlands and streams also rely on sustained groundwater levels to avoid drying up, especially during the dry season, late summer or fall, or droughts. These ecosystems provide habitat for migratory birds, such as sandhill cranes, and for fish, such as salmon.

Without a healthy groundwater system, these habitats risk going dry, threatening local plants and wildlife. It’s up to us to protect these important ecosystems in groundwater planning and decision-making.



[LEARN MORE ABOUT GROUNDWATER DEPENDENT ECOSYSTEMS](#)

California Groundwater

California is celebrated for its beautiful waterways, productive agriculture, and diverse communities and landscapes. Groundwater, one of California's rich resources, is at risk.

01

Groundwater In California

California depends heavily on groundwater to meet its water supply needs. Groundwater, which largely comes from rain and snow that seeps through soil and rock, supplies approximately **40 percent** of the state's water supply.

02

Overdraft

Over the last century, California has experienced groundwater overdraft. Overdraft occurs when more groundwater is pumped out from underground than is replaced. This is caused by increased agricultural, residential, and industrial development, as well as droughts that reduce the amount of water returning to aquifers.

03

Sustainable Management

It will take many wet years and sustainable water management to restore our underground subbasins to balance for current and future generations. For this reason, the California Legislature adopted the Sustainable Groundwater Management Act of 2014 (SGMA).



The quality and quantity of groundwater are interrelated.

Most groundwater is brought to the surface by pumping it through a well. While underground, that water can accumulate many contaminants, both naturally occurring and human-made. Thus, even if we have water to pump from our wells, we can't use it if it's contaminated.

And we aren't the only ones who depend on groundwater!

SGMA 101



01

Sustainable Groundwater Management Act

Groundwater is a critical resource for California's ecosystems, communities, and economies. In response to decades of overuse and a prolonged drought that led to declining groundwater levels, the California legislature adopted the Sustainable Groundwater Management Act of 2014 (SGMA, pronounced "sigma").

[LEARN MORE ABOUT THIS LAW HERE](#)

02

In a Nutshell, What is SGMA?

Sustainable groundwater management aims to balance the resource needs of communities, economies, and the environment. The Sustainable Groundwater Management Act (SGMA) is legislation that requires groundwater resources to be used and replenished so they remain a reliable and healthy source of water for all who depend on them. SGMA requires that we consider and protect all uses of groundwater. This includes farms, cities, businesses, tribes, and households that depend on local groundwater, as well as the creeks, rivers, marshes, and wetlands that rely on groundwater resources. SGMA is built on the premise that local knowledge and the best available science will create the most effective plan for understanding and managing local groundwater resources.

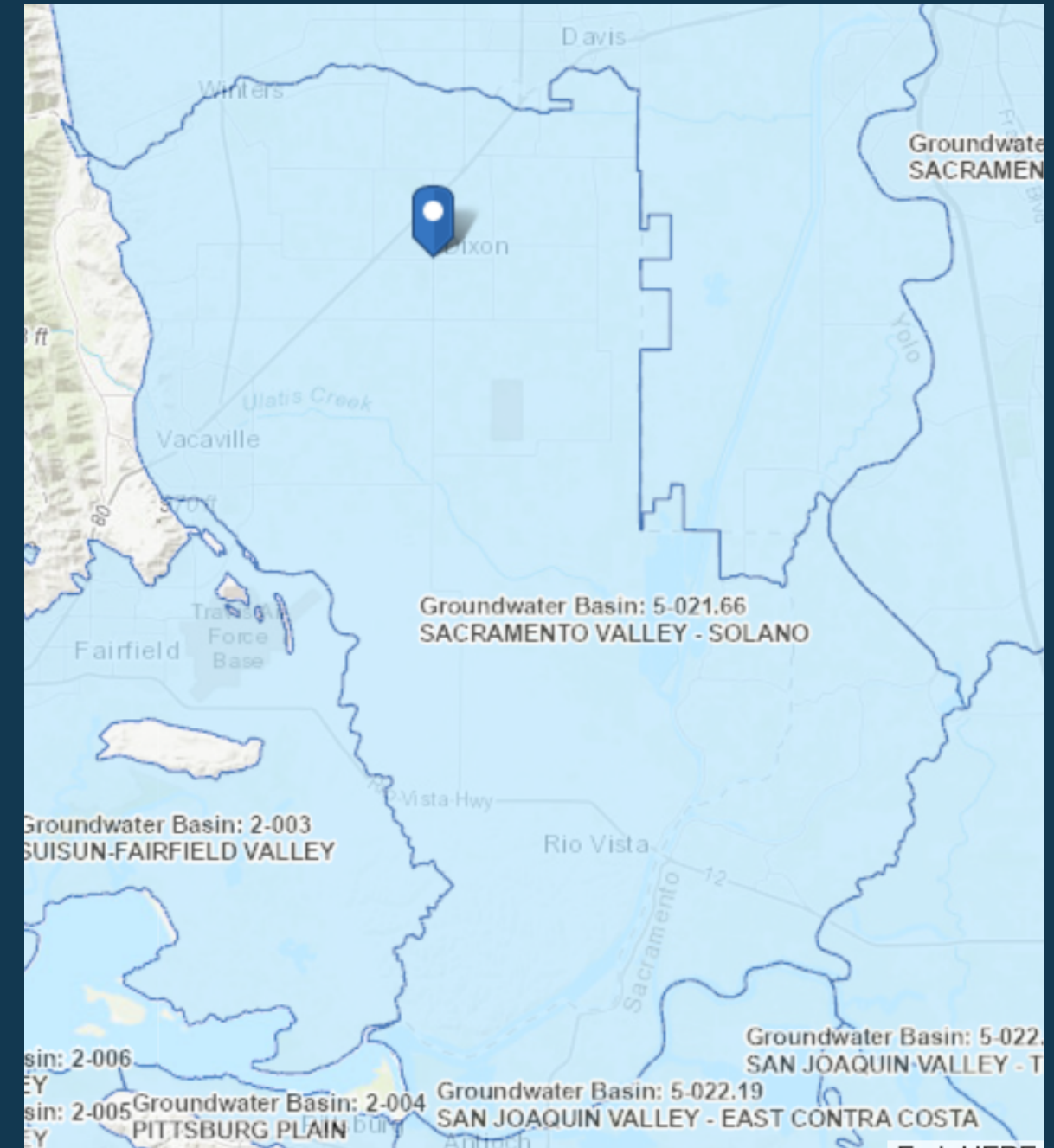
The Sustainable Groundwater Management Act corrects our current course to ensure the long-term reliability of our connected surface water and groundwater resources.

03

Subbasins

The Department of Water Resources (DWR) divides California's groundwater basins into Subbasins. Subbasin boundaries combine political (county and city lines) and hydrogeologic features (aquifers, faults, streams). California leaders determined that the best way to achieve statewide groundwater sustainability is to allow local groups, who understand their communities best, to develop plans at the local level. The plans are called "Groundwater Sustainability Plans."

[LOOK UP WHICH SUBBASIN YOU LIVE, WORK, OR PLAY IN HERE](#)



04

What is Included in a Groundwater Sustainability Plan (GSP)?

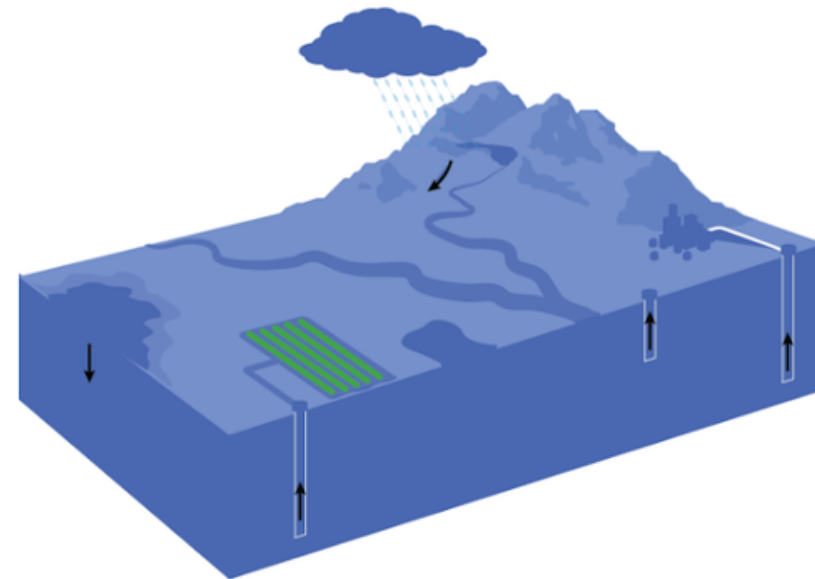
Groundwater Sustainability Agencies were created to develop and implement Groundwater Sustainability Plans across the State. The plans include:

Who?



Identifying all groundwater users and uses in the basin.

What?



Understanding the groundwater basin, how much water is used, and how much water replenishes the basin.

Where?



Creating sustainability goals to avoid “undesireable results” that may worsen water quality or quantity.

How?



Developing solutions, such as projects or management actions, to meet sustainability goals, and creating a monitoring plan to track progress.

What are GSAs?

The Sustainable Groundwater Management Act empowers existing local water agencies, such as municipal water agencies, reclamation districts, counties, or irrigation districts, to form Groundwater Sustainability Agencies (GSAs).

These agencies are responsible for working with their local communities to develop a Groundwater Sustainability Plan (GSP), which includes:

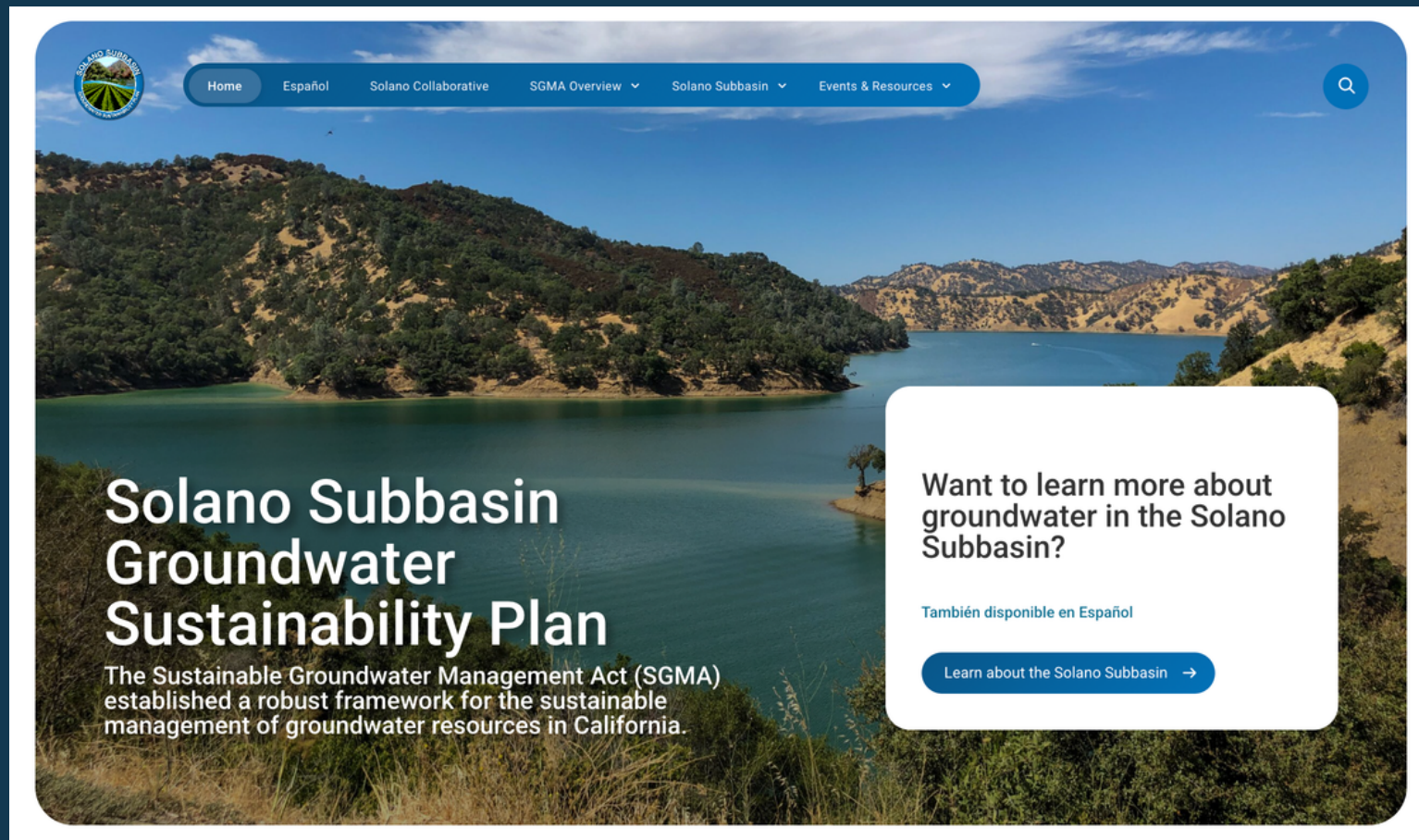
1. Assessing current groundwater conditions and characterizing water use
2. Working with the beneficial users and uses in their subbasin to develop and implement sustainability goals to address current and future challenges
3. Identifying projects, programs, and actions to meet sustainability goals
4. Developing monitoring networks to track the achievement of the sustainability goals

GSAs are required to "encourage the active involvement of diverse social, cultural, and economic elements of the population within the groundwater basin prior to and during the development... of the groundwater sustainability plan." (Wat. Code § 10727.8, subd. (a))

If a GSA does not develop a GSP to set a path toward sustainability, **or** if the subbasin fails to meet its sustainability goals, the State will take over management of the local basin.

[Find your local GSA here](#)

Solano Subbasin & SGMA



01

Solano Subbasin Groundwater Sustainability Plan (GSP)

The Solano Subbasin GSP was submitted to the California Department of Water Resources (DWR) on Jan. 31, 2022.

Plan development focused on strengthening our understanding of:

- How does the Solano Subbasin groundwater work?
- How much water is stored within the basin?
- How much water comes into the basin each year through recharge?
- How much is used or leaves the basin through evaporation and leakages into neighboring basins?

This hydrogeological understanding allows us to assess the reliability of our groundwater resources and the baseline conditions. Once that is better understood, we can make management decisions to ensure that groundwater conditions remain reliable in the future.

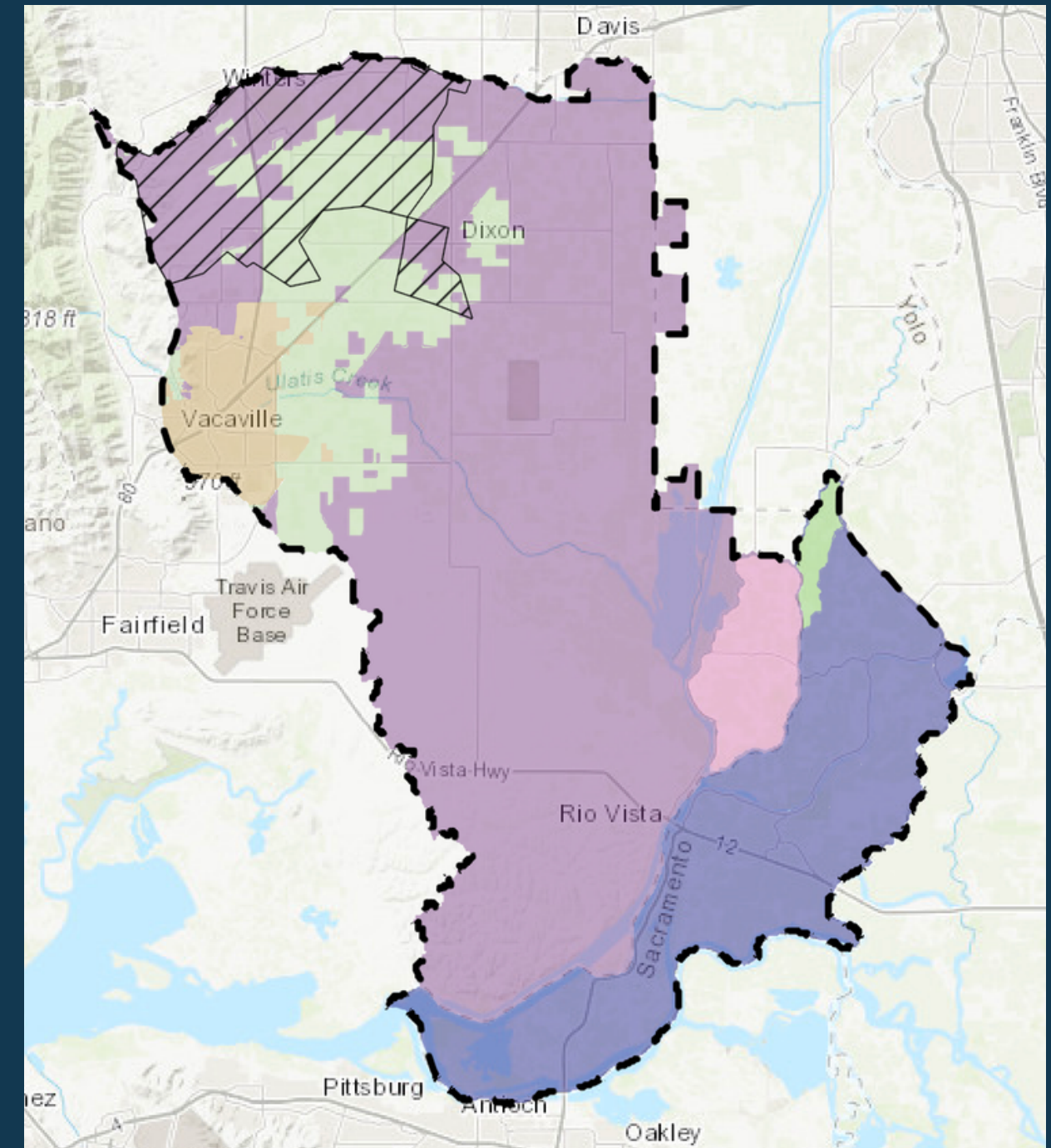
[VIEW THE FULL SOLANO SUBBASIN GSP AND LEARN MORE](#)

02

Solano Subbasins Boundries

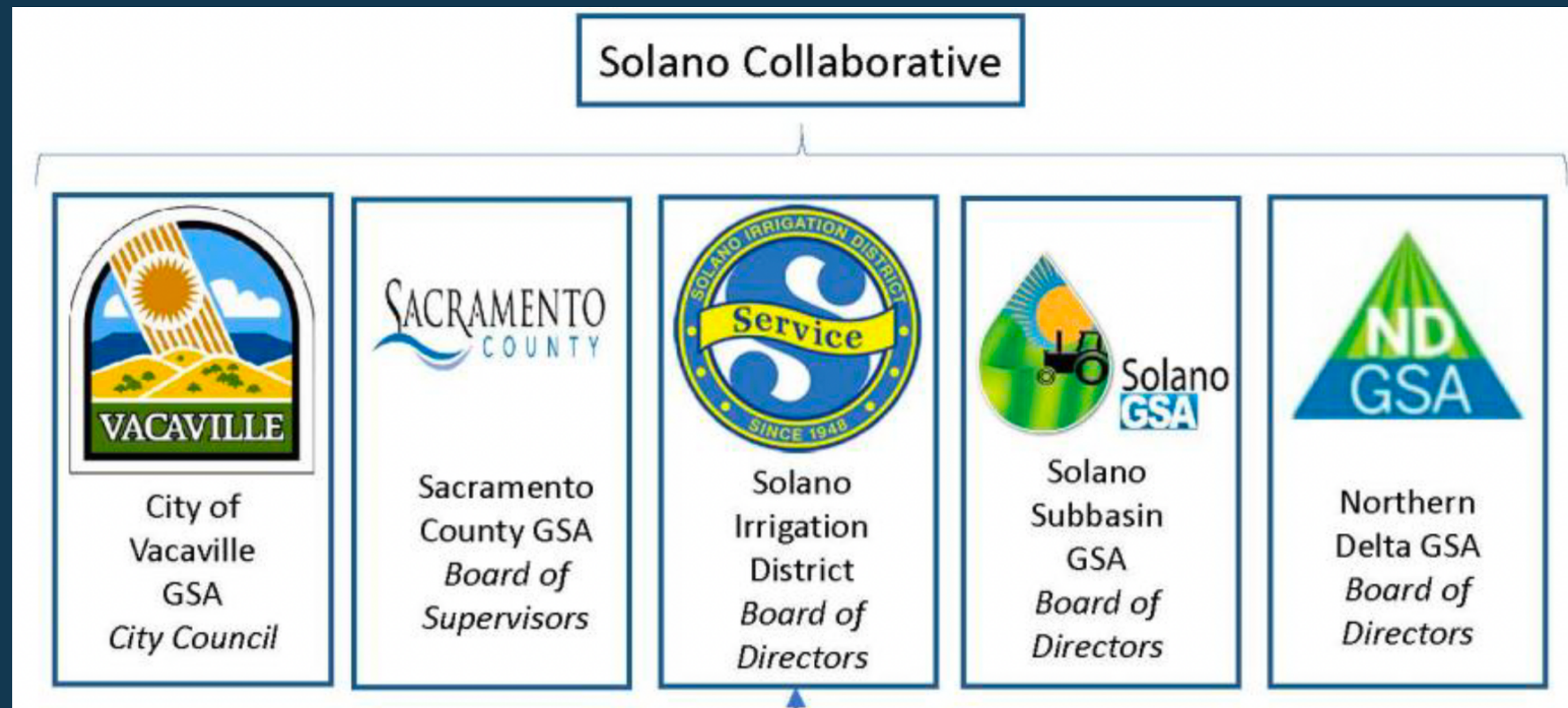
The Solano Subbasin is a small part of the very large Sacramento and San Joaquin Valley groundwater basin. The Solano Subbasin includes the communities of Dixon, Rio Vista, Isleton, Elmira, Sherman Island, portions of Vacaville, the Montezuma Hills, and Walnut Grove.

[ARE YOU IN THE SOLANO SUBBASIN? FIND OUT HERE](#)



GSAs in the Solano Subbasin

Five Groundwater Sustainability Agencies: Solano GSA, City of Vacaville GSA, Sacramento County GSA, Solano Irrigation District GSA, Northern Delta GSA, and an independent GSA Reclamation District (RD) 349 have joined together as the “Solano Collaborative” to jointly develop one Groundwater Sustainability Plan (GSP) for the entire Subbasin.



Thank You!

Visit solanoGSP.com
to learn more